

REMARKS

Claims 1, 2 and 4-23 are pending.

Claims 1, 2, 4, 5, 8-10, 13, 15, 16, 18, 22 and 23 were rejected under 35 USC 103(a) as being unpatentable over POTYRAILO et al. 6,684,683 in view of HAGER et al. 4,783,987. That rejection is respectfully traversed.

Claim 1 is amended and recites at least one polycrystalline piezoelectric layer. Support for this feature may be found, for example, on page 10, line 30 to page 11, line 6. Please note that although this passage does not explicitly use the term "polycrystalline", nevertheless, one of ordinary skill in the art would readily recognize that the use of physical vapor deposition (PVD) or chemical vapor deposition (CVD) to form a piezoelectric layer as disclosed in this passage would inherently form a polycrystalline piezoelectric layer and would not result in a monocrystalline piezoelectric layer.

Such polycrystalline piezoelectric layer leads to frequencies in the GHz-range for thickness shear oscillation as further recited.

Both POTYRAILO and HAGER are directed to monocrystalline piezoelectric devices. See, for example, column 3, lines 49-51 of POTYRAILO and claim 17 and column 6, lines 9-12 of HAGER.

Moreover, column 4, lines 1-3 of POTYRAILO discloses operation in the thickness shear mode at a frequency of about 0.1

to about 70 MHz. Column 6, lines 13-18 of HAGER disclose operation in the thickness shear mode in a frequency range between 2 and 20 MHz.

Neither of the references discloses operation in the thickness shear mode in a range from 500 MHz to 10 GHz as recited.

The above noted features are missing from each of the references, are absent from the combination and thus, would not have been obvious to one having ordinary skill in the art.

In addition, based on the different techniques used by the references, one of ordinary skill in the art would not have considered their combination in the first instance.

HAGER is directed to energy transfer from the piezoelectric element to a liquid.

In contrast, POTYRAILO is not based on energy transfer to the investigating medium and rather, is based on barrier properties of coatings. Moreover, the medium in POTYRAILO is a gas.

In view of the above, it is apparent that even if one of ordinary skill in the art would have considered the proposed combination in the first instance, the proposed combination does not disclose that which is recited.

Accordingly, claim 1 and the claims that depend therefrom are believed patentable over the proposed combination of references.

Claims 6 and 14 were rejected over POTYRAILO in view of HAGER and further in view of KOBRIN et al. 5,935,150. That rejection is respectfully traversed.

KOBRIN is only cited with respect to features of dependent claims 6 and 14. KOBRIN does not teach what is recited in claim 1. As set forth above, POTYRAILO in view of HAGER does not suggest what is recited in claim 1. Since claims 6 and 14 depend from claim 1, claims 6 and 14 are believed patentable at least for depending from an allowable independent claim.

Moreover, as set forth in the amendment of March 15 2007, one of ordinary skill in the art would recognize that the polar c-axes of the crystallites of the piezoceramic film of KOBRIN are oriented perpendicular to the surface of the substrate. Such a configuration limits KOBRIN to longitudinal mode oscillation, which is used to detect a substance in a vapor. In such a mode, the resonance is strongly attenuated by a liquid.

KOBRIN must be used in longitudinal mode in order for the acoustic isolator of KOBRIN to function as it was intended. Column 2, lines 42-62 describe the use of the acoustic isolator in a longitudinal configuration to obtain acoustical isolation.

Thus, there is no motivation to combine KOBRIN with any reference that either teaches thickness shear mode oscillation or teaches detection of a liquid.

Claim 7 was rejected over POTYRAILO in view of HAGER and further in view of HIRAMA et al. 4,870,313. That rejection is respectfully traversed.

HIRAMA does not overcome the shortcomings of the POTYRAILO/HAGER combination set forth above with respect to claim 1. Since claim 7 depends from claim 1, claim 7 is believed patentable at least for depending from an allowable independent claim.

Claims 11 and 12 were rejected over POTYRAILO in view of HAGER and further in view of CHANG et al. 6,607,934. That rejection is respectfully traversed.

CHANG does not overcome the shortcomings of the POTYRAILO/HAGER combination set forth above with respect to claim 1. Since claims 11 and 12 depend from claim 1, claims 11 and 12 are believed patentable at least for depending from an allowable independent claim.

Claim 17 was rejected over POTYRAILO in view of HAGER and further in view of BAER et al. 5,130,257. That rejection is respectfully traversed.

BAER does not overcome the shortcomings of the POTYRAILO/HAGER combination set forth above with respect to claim 1. Since claim 17 depends from claim 1, claim 17 is believed patentable at least for depending from an allowable independent claim.

Claims 19-21 were rejected over POTYRAILO in view of HAGER and further in view of ZHANG et al. 2005/0148065. That rejection is respectfully traversed.

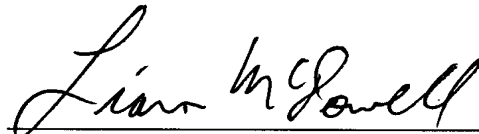
ZHANG does not overcome the shortcoming of the POTYRAILO/HAGER combination set forth above with respect to claim 1. Since claims 19-21 depend from claim 1, claims 19-21 are believed patentable at least for depending from an allowable independent claim.

In view of the present amendment, and the foregoing remarks, therefore, it is believed that this application has been placed in condition for allowance, and reconsideration and allowance are respectfully requested.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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